

Claims

[c1] What is claimed is:

1.A liquid crystal display comprising:
a lower substrate;
an upper substrate positioned parallel with the lower
substrate; and
a plurality of pixel units, each of the pixel units including
an upper transparent electrode, a liquid crystal layer, a
lower transparent electrode, and a color filter;
wherein a surface of each color filter has a plurality of
recess structures.

[c2] 2.The liquid crystal display of claim 1 wherein a distribution density of the recess structures is used to regulate brightness and a color deepness of the liquid crystal display.

[c3] 3.The liquid crystal display of claim 1 wherein each of the pixel units respectively comprises a reflection layer positioned between the color filter and the lower substrate.

[c4] 4.The liquid crystal display of claim 3 being a reflective liquid crystal display.

- [c5] 5.The liquid crystal display of claim 3 wherein each of the reflection layers includes an opening.
- [c6] 6.The liquid crystal display of claim 5 being a semi-transmissive and semi-reflective liquid crystal display.
- [c7] 7.The liquid crystal display of claim 1 further comprising a plurality of thin film transistors for respectively controlling each of the pixel units.
- [c8] 8.A liquid crystal display comprising:
 - a lower substrate;
 - an upper substrate positioned parallel with the lower substrate; and
 - a plurality of pixel units, each of the pixel units including an upper transparent electrode, a liquid crystal layer, a lower transparent electrode, and a color filter;
 - wherein each of the color filters includes both a first region and a second region, and a surface of the first region has a plurality of recess structures.
- [c9] 9.The liquid crystal display of claim 8 wherein an area of the first region of the color filter is used to regulate brightness and a color deepness of the liquid crystal display.
- [c10] 10.The liquid crystal display of claim 8 wherein a distri-

bution density of the recess structures is used to regulate brightness and a color deepness of the liquid crystal display.

- [c11] 11.The liquid crystal display of claim 8 wherein each of the pixel units respectively comprises a reflection layer positioned between the color filter and the lower substrate.
- [c12] 12.The liquid crystal display of claim 11 being a reflective liquid crystal display.
- [c13] 13.The liquid crystal display of claim 11 wherein each of the reflection layers respectively includes an opening opposite to the second region of each color filter.
- [c14] 14.The liquid crystal display of claim 13 being a semi-transmissive and semi-reflective liquid crystal display.
- [c15] 15.The liquid crystal display of claim 8 further comprising a plurality of thin film transistors for respectively controlling each of the pixel units.